REMARKS

Claims 1-44 are pending. Claims 1-16, 26-32 and 43-44 were previously elected for examination in response to a restriction requirement. Claims 17-25 and 33-42 were withdrawn.

Claims 1-5, 8-12, 14, 26, 28-39 and 43-44 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Reny, WO89/09806. Claims 1-16, 26-32 and 43-44 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Cougenhour, Chemical Abstracts 120:195478 or Dingley, Chemicals Abstracts 116:86516 or Evans, U.S. Patent No. 5,031,579 each in view of Mascioli, U.S. Patent No. 5,240,631, or Greaney, U.S. Patent No. 5,422,026 or Uekusa, U.S.Patent No. 5,387,360.

Applicant has amended claims 1, 2, 7, 10, 11, 16, 26 and 32. Claims 43-44 are cancelled. New claim 45-48 are added. Accordingly, claims 1-16, 26-32 and 45-48 are pending. For at least the reasons set forth below, the claims as amended are patentable over all of the references cited by the examiner. Support for the amendments to claims 1, 2, 10 and 11 can be found at, for example, paragraphs 0033 and 0034 of the published application (Publication No. US2004/0099839). Support for new claims 45-48 can be found at, for example, paragraph 0047 of the published application. No new matter is added.

As described in the specification and recited in the claims as amended, the present invention is directed to a non-aqueous, propylene glycol based heat transfer fluid. The heat transfer fluid contains only additives that are soluble in propylene glycol. The non-aqueous heat transfer fluid does not contain any additives, such as silicates or buffers, that require the addition of water to the non-aqueous heat transfer fluid to dissolve the additive or to permit the additive to function in the fluid (e.g. such as by dissociation). The term "non-aqueous" as

used in the amended claims is defined in paragraph 0056 of the specification as meaning that "water is present as an impurity in the coolant formulation in no greater than a concentration of about 0.5% by weight." The non-aqueous heat transfer fluid contains no added water. As recited in new claim 45, and described in the specification at paragraph 0047, the non-aqueous heat transfer fluid may contain up to 60% by weight ethylene glycol. Among the advantages of the non-aqueous coolant of the present invention is that a single formulation can be used in many different environments. The non-aqueous coolant is a stable solution with its inhibitors and there is no drop-out or gelling of additives, regardless of use or storage.

Rejection Under 35 U.S.C. §103(a) Based Upon Reny

Claims 1-5, 8-12, 14, 26, 28-30 and 43-44 stand rejected under 35 U.S.C. §103 as obvious based upon Reny, WO89/09806. Reny does not teach or describe any composition that meets all of the limitations of the claims as amended. Specifically, Reny does not teach or describe a non-aqueous heat transfer fluid comprising neat propylene glycol, or combinations of propylene glycol and up to 60% by weight ethylene glycol, that contains less than 0.5% by weight water, and that contains no additives requiring the presence of water to dissolve the additive or to enable the additive to perform its intended function. To the contrary, Reny teaches that a propylene glycol based heat transfer fluid must contain phosphoric acid and at least 1% by weight water.

Reny describes heat transfer fluids that may contain alkylene glycols, corrosion inhibitor additives, phosphoric acid to buffer the pH of the fluid and up to 10 percent water. In the rejection under Section 102(b), the Examiner, on page 2 of the Office Action, relies on statements at page 3, lines 1-11 of Reny which generally describe a coolant composition that contains at least 90 weight percent of an alkylene glycol or a mixture of two or more alkylene

glycols, a corrosion inhibiting amount of an inhibitor, and from 0 to 3 percent phosphoric acid. This portion of Reny does not describe the use of any particular alkylene glycols, much less describe the use of propylene glycol as the heat transfer fluid. Moreover, this portion of Reny cited by the Examiner does not discuss at all whether water is added to a propylene glycol heat transfer fluid. The Examiner overlooks the requirement at page 3, lines 6-7 of Reny that the heat transfer fluids contain "from 0 to 3 weight parts of phosphoric acid." As described in the specification of the present application at, for example, paragraphs 0024 to 0026, phosphoric acid is used in many heat transfer fluids to buffer the pH of the fluid, and these heat transfer fluids require added water to dissolve the phosphoric acid and enable it to function as a buffer. This is consistent with the discussion in Reny at page 5, lines 22-26, Reny, where Reny states that phosphoric acid "is employed to maintain the pH of the coolant composition in the range from 7 to 9." Any heat transfer fluid that includes a phosphoric acid buffer necessarily includes added water.

The Examiner notes that Reny states at page 5, lines 28-34, that the coolant most preferably contains essentially no water. However, this statement is cited out of context. In the immediately preceding paragraph, Reny states, at page 5, lines 21-26, that phosphoric acid is added if necessary to maintain the pH of the coolant between 7 to 9, but that "[s]ome alkylene glycol mixtures are within the pH limits, and in such cases no pH adjustment is needed." Reny does not disclose, however, any alkylene glycol mixtures that would not require the addition of phosphoric acid as a pH buffer, and he certainly does not describe any propylene glycol coolants, or combinations of ethylene glycol and propylene glycol, that do not require a phosphoric acid buffer and added water. To the contrary, all of the examples of the fluid and preferred embodiments disclosed in Reny, including the examples of neat

propylene glycol fluids and mixtures of ethylene glycol and propylene glycol described in the specification and in Table 1, contain at least 1 part water added to the alkylene glycol, and the addition of phosphoric acid, a substance that requires water to enable it to function. Thus, in all of the heat transfer fluids comprising propylene glycol, or combinations of ethylene glycol and propylene glycol, described by Reny, phosphoric acid and water are included to form a pH buffer.

Phosphoric acid, the use of which is taught by Reny in heat transfer fluids comprising ethylene glycol and propylene glycol, is an undesirable ingredient in the claimed non-aqueous heat transfer fluid for a number of reasons. In order for the phosphoric acid to perform its function as an acid, there must be sufficient water added for the phosphoric acid to ionize. Ionized phosphoric acid forms phosphate compounds with engine metals such as iron. The resulting phosphate compounds have limited solubility and will precipitate in a low water environment, such as in a non-aqueous heat transfer fluid. For example, a manufacturer of heat transfer fluid additives, Penray Companies, Inc., states that "Silicate and phosphate, while valuable as corrosion inhibitors in engine coolant, have limited solubility. That meant that if the antifreeze . . . got too concentrated in the coolant [i.e. there is not sufficient water, as in a non-aqueous heat transfer fluid], then the excess phosphate and/or silicate would drop out of the coolant." *See* www.penray.com/coolingtechfacts/.

A prior art reference must be considered in its entirety, including portions that lead away from the claimed invention. MPEP § 2141.03; *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984).

> It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position to the exclusion of other parts

> necessary to the full appreciation of what such reference fairly suggests to one skilled in the art.

In re Wesslau, 353 F.2d 238, 241 (CCPA 1965). The Federal Circuit has held that it is improper to consider a single line taken out of context from a reference without considering other statements in the reference that argue against obviousness. *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 448 (Fed. Cir. 1986).

Reny at most teaches that some undisclosed combinations of alkylene glycols may not require addition of phosphoric acid and water, and that these components are only added when necessary. In all of the fluids described in Reny that contain propylene glycol, however, Reny describes the addition of phosphoric acid and at least 1% water. Therefore, when Reny is considered in its entirety, as required under section 103, Reny teaches that propylene glycol based heat transfer fluids require the addition of phosphoric acid and water.

Accordingly, Reny does not teach, describe or otherwise suggest a non-aqueous heat transfer fluid as defined in the specification and recited in the claims as amended comprising propylene glycol with less than 0.5% by weight water and that does not contain any additives that require water to dissolve the additives in the fluid or to enable the additives to function in the fluid. For at least these reasons, claims 1-5, 8-12, 14, 26 and 28-30 as amended and new claims 45-48 are not obvious in view of Reny.

Rejection Under 35 U.S.C. §103(a) Based Upon Cougenhour, Dingley or Evans

Claims 1-16, 26-32 and 43-44 stand rejected based upon Cougenhour, Dingley or Evans in view of each of Mascioli, Greaney and Uekasa. As set forth in detail below, none of these references can be properly combined in a manner which results in the non-aqueous heat transfer fluid of the claims as amended.

Cougenhour describes engine tests which were conducted using non-aqueous propylene glycol as an engine coolant. Cougenhour states that the results of the tests quantified "some of the presumed advantages and disadvantages" of the use of non-aqueous propylene glycol, and that the results formed the basis for further work "using total-vehicle systems." Cougenhour does not describe, teach or suggest a non-aqueous propylene glycol heat transfer fluid having dissolved inhibitors as recited in the amended claims.

Dingley describes the use of monopropylene glycol both as a component of an engine coolant and as the entire coolant. Dingley describes the use of monopropylene glycol alone in general terms, and Dingley does not teach or suggest a non-aqueous propylene glycol heat transfer fluid having dissolved inhibitors as recited in the amended claims.

Evans describes a cooling system for internal combustion engineers for use with a substantially anhydrous, boilable liquid coolant having a saturation temperature higher than that of water. Evans describes tests of the cooling system that were conducted using neat propylene glycol as the coolant in the improved design. Evans does not describe, teach or suggest an engine coolant containing corrosion inhibitors of the type recited in the claims as amended.

Thus, as recognized by the examiner, each of Cougenhour, Dingley and Evans do not describe, teach or suggest a non-aqueous propylene glycol based heat transfer fluid having corrosion inhibitors which are soluble in propylene glycol and that do not require the addition of any water to the heat transfer fluid as recited in the claims as amended. The examiner attempts to address this deficiency in these references by stating that each of them can be combined with any one of Mascioli, Greaney or Uekasa to arrive at the claimed compositions. However, Mascioli, Greaney and Uekasa each describe additive packages for heat transfer

fluids requiring the addition of water to the heat transfer fluid. This is consistent with the prevailing view at the time, as set forth in detail in the inventors prior Declaration, that the common understanding of those skilled in the art at the time of the invention was that additives that required added water were required in anti-freeze formulations.

Mascioli describes corrosion-inhibited antifreeze concentrate formulations and aqueous corrosion-inhibited antifreeze formulations for use in engines. Mascioli states that antifreeze formulations in which propylene glycol is the primary component formed undesirable oxidation products. Col. 2, lines 19-24. Mascioli solves this problem by adding phosphorous acid to the formulation, as well as an alkali metal hydroxide to provide a final pH of 7-10 for the concentrate plus water coolant formulation. Col. 2, lines 24-27, 49-51. Mascioli also includes silicates in the heat transfer fluid in the form of sodium silicate, which is soluble in water, but insoluble in alcohol (see General Description of Sodium Metasilicate, U.S. Dept. of Labor, OSHA, http://osha.gov/dts/chemicalsampling/data/CH_267715.html). Col. 2, lines 42-43; col. 3, lines 3-4. These additives taught by Mascioli require the presence of water in the concentrate to dissolve or enable the additive to function, and Mascioli states that the concentrate formulation contains 1 to 5% by weight water. Col. 2, lines 47-48, Table 1.

A rejection under section 103 cannot be based on selecting only portions of a reference to support the rejection, to the exclusion of other parts of the reference necessary to understanding what the reference fairly suggests to one skilled in the art. *In re Wesslau*, 353 F.2d 238, 241 (CCPA 1965). When Mascioli is considered as a whole, as is required under section 103, Mascioli includes additives requiring water to remain in solution, as well as 1% to 5% added water. Therefore, combining any one of Cougenhour, Dingley or Evans with

Mascioli results in a concentrate containing additives requiring water to remain in solution or to perform their function, and between 1% and 5% added water. Accordingly, the combination of these references results in a heat transfer fluid that does not meet all of the limitations of the claims as amended.

Greaney describes a heat transfer concentrate similar to that described in Mascioli, except that the fluid of Greaney does not contain phosphates. Col. 2, lines 30-32. As with Mascioli, the heat transfer fluid contains silicates, an alkali metal hydroxide for pH control, and 1% to 5% by weight added water. Col. 2, lines 37-52 and Table 1. Therefore, when read as a whole, Greaney teaches a heat transfer concentrate that necessarily includes additives requiring water to remain in solution or to perform their function, and between 1% and 5% added water. Accordingly, the combination of any one of Cougenhour, Dingley or Evans with Greaney results in a heat transfer fluid that does not meet all of the limitations of the claims as amended.

Uekusa has a United States filing date of October 5, 1993, which is after the September 10, 1993 priority date of the present application. Accordingly, Uekusa is not prior art, and to the extent that the rejection under 35 U.S.C. §103(a) is based upon Uekusa, the rejection should be withdrawn. However, even if Uekasa could be considered prior art, Uekasa teaches that the heat transfer fluid contains "citric acid and/or salts thereof as an essential constituent." Col. 2, lines 52-53. This requires the addition of water to the fluid, and all of the examples of the fluid in Tables 1, 6 and 7 of Uekasa contain at least 2% by weight added water. Because the heat transfer fluid of Uekasa includes added water, combining the teachings of Uekasa with any one of Cougenhour, Dingley or Evans does not result in a heat transfer fluid meeting all of the limitations of the claims as amended.

Thus, each of Mascioli, Greaney, and Uekasa teach the addition of an additive requiring water in the heat transfer fluid, and each specifically teach the addition of some amount of water to the heat transfer fluid. It is only by ignoring these teachings in Mascioli, Greaney, and Uekasa that the examiner is able to construct a composition meeting all of the limitations of the claims as amended. "Determination of obviousness cannot be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention." *ATD Corp. v. Lydall, Inc.*, 159 F.3d 534, 546 (Fed. Cir. 1998).

Because the reasons above are sufficient to traverse the rejection, Applicants have not explored, nor do they now present, other possible reasons for traversing such rejections. Nonetheless, Applicants expressly reserve the right to do so, if appropriate, in response to any future Office Action.

A petition for extension of time has been submitted herewith to extend the deadline for filing this submission in lieu of an appeal brief until August 28, 2006. No additional fee is believed to be required. However, if an additional fee is required or otherwise necessary to cover any deficiency in fees previously paid, authorization is hereby given to charge our Deposit Account No. 50-3569.

Serial No. 10/629,642
Response to Office Action Mailed November 28, 2005

Docket No.: 97541.00022

Respectfully submitted,

Date: August 25, 2006

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